

***Cardium angulatum* Lamarck, 1819: a misinterpreted senior synonym of *Cardium alternatum* Sowerby, 1840.**

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ABSTRACT

Examination of the type material of *Cardium angulatum* Lamarck 1819, demonstrates that the name is not a synonym of *C. rugosum* as it has often been accepted. Instead it proves that *C. angulatum* is the valid name for the Indo Pacific species known as *C. alternatum* Sowerby, 1840. Because Sowerby's name is not that of a common and/or economically important species, it is proposed to adopt Lamarck's name.

INTRODUCTION

Lamarck (1819:9) thus introduced the name *Cardium angulatum*: No 19, Bucarde anguleuse. *Cardium angulatum*. "C. testa longitudinali, ovata, obliqua, albida, superne purpureo zonata : costis 32, dorso angulatis, transverse sulcatis; antierius hiante. Seba, Mus. 3. Tab. 86, Fig. 6.. Habite....les mers d'Amerique? Mon cabinet. Les cotes du cote posterieur, sont comme crenelees obliquement par des tubercules allonges. Longueur, 68 millimetres. Le Museum en possede une variete blanche nuee de fauve."

In the present paper I examine briefly previous opinions on the name *Cardium angulatum* Lamarck; I then report on my examination of the type material; finally I examine the nomenclatural consequences of my findings.

The name *Cardium angulatum* in the literature

Deshayes (1835: 399) repeated verbatim Lamarck (1819), but added in a footnote: "La coquille qui, dans la collection du Museum, porte ce nom, est un grand et bel individu du *Cardium rugosum* No 23. Nous ne savons s'il en est de meme de la coquille de la collection de Lamarck." [The shell which, in the Museum collection, bears this name, is a large and fine specimen of *C. rugosum*, No 23. We do not know if the same is true for the shell in Lamarck's collection.]

Sowerby (1841: 4) listed, but did not figure, *C. angulatum* Lamarck in his list of recent species of *Cardium*. He apparently considered it a valid species, and gave the reference to Seba's figure. Sowerby (1842: 97, 297, fig. 123) figured as *Cardium angulatum* a shell which earlier (1839: 18, fig. 123) he had figured (in error ?) as *C. maculosum*.

Reeve (1845: species 70) describes *C. angulatum* Lamarck and gives a new illustration based on a shell in "Mus. Saul".

From that moment three different interpretations of the name *Cardium angulatum* have appeared in the literature:

- (i) Probably based on Lamarck's type locality: ("the seas of America?"), d'Orbigny (1853), Schramm (1867) and Martens (1889) used *C. angulatum* as the valid name of the Western Atlantic species now known as *Trachycardium* or *Acrosterigma magnum* (L.) (see Clench & Smith 1944).
- (ii) Romer (1869: 56), based on the footnote of Deshayes, considers *C. angulatum* a synonym of *C. rugosum*, both placed in the synonymy of *C. flavum*. This opinion was followed by many later authors (e.g. Lamy 1941, Fischer Piette 1977).
- (iii) Hedley (1899) and Hidalgo (1903) used *C. angulatum* Lamarck as a valid specific name but their concept of the name was based on Reeve's figure and description. Abbott & Dance (1982) apparently used the name [as *Trachycardium angulatum* (Lamarck, 1822)] in this sense.

All of the authors since 1905 have apparently overlooked Bulow (1905), who concluded that Reeve's description and figure referred to a different species from that of Lamarck. He named it *Cardium pseudoangulatum* and based his description on a shell of his own collection.

It then appears that most opinions on Lamarck's *C. angulatum* are based on interpretations of the original description and/or Seba's illustration. Only Deshayes did examine one of the syntypes, and it is on his authority that the name *angulatum* has consistently been misinterpreted as demonstrated below.

All nominal species involved are now tentatively placed by Wilson & Stevenson (1977) in the trachycardiine genus *Acrosterigma* Dall, 1900, a decision with which I provisionally agree.

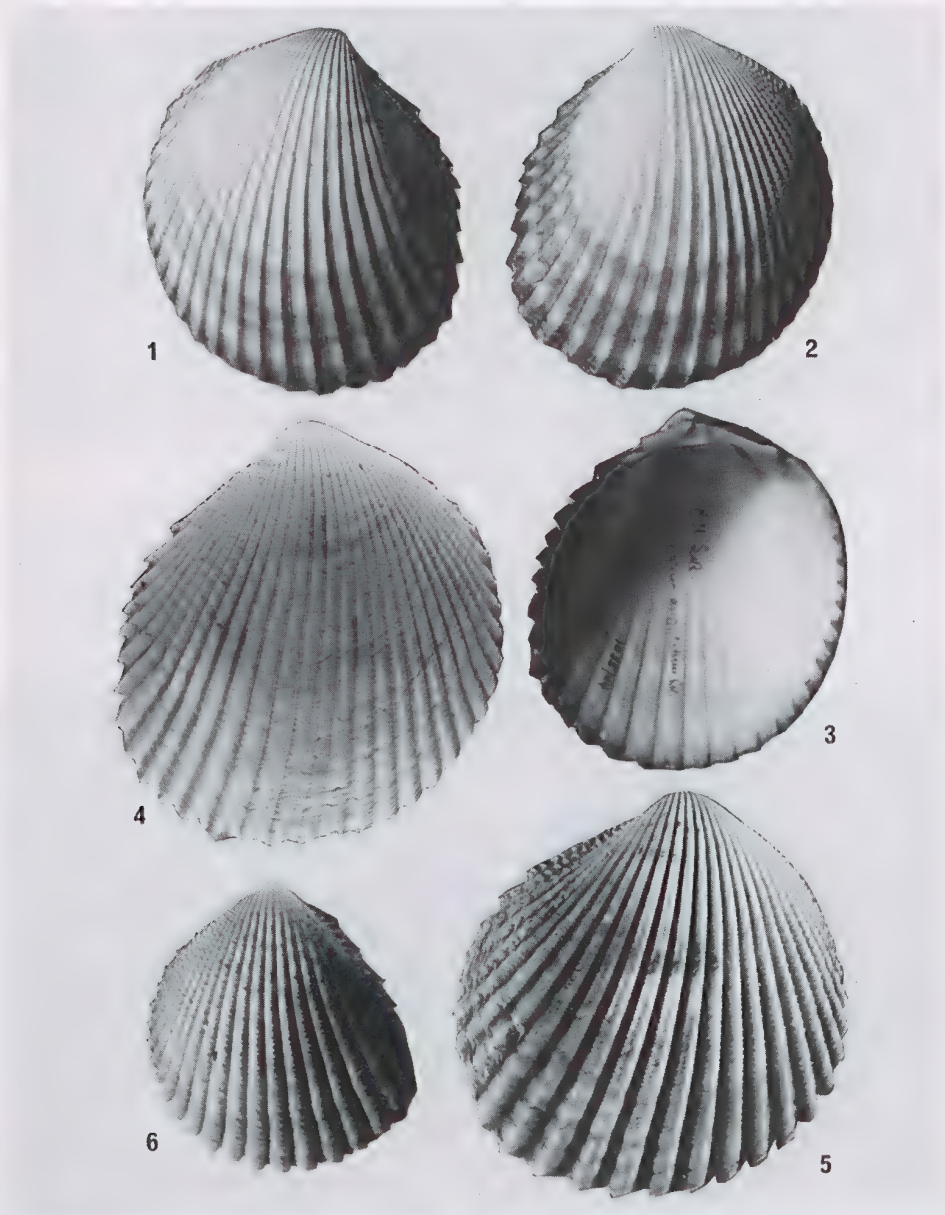
Examination of Lamarck's type material

The name *Cardium angulatum* is based on three different specimens:

- (a) The shell depicted by Seba (1758); the figure is good but the shell is apparently not traceable to any Museum collection.
- (b) The 68 mm shell from Lamarck's private collection, which is now in the Museum d'Histoire Naturelle de Geneve (MHNG).
- (c) The colour variety from the "Museum" collection, which is still in the Museum National d'Histoire Naturelle (MNHN).

I have examined both syntypes in MHNG and MNHN:

- (i) The specimen from Geneva, registered No. 1095/44 19L, (Fig. 1, 2, 3) is 68 mm high, 59 mm long and 41 mm wide. Shell obliquely ovate; antero-ventral edge rounded, posterior margins flared out, forming a wing. Consequently the ribs are notably curved away. In the ventral part of the shell, valves touch only along a few ribs, the anterior and posterior edges gaping uniformly. Anterior gaping is less than 1 mm wide, the posterior one being almost 3 mm wide. Hinge line typical of the genus. Number of ribs: 31 in the right, 32 in the left valve. The ribs and interstices in the medio-posterior zone are notably larger. Detailed description of ribs and sculpture is given below. Exterior colour uniformly cream in the oldest part of the shell. In the younger part, there are several concentric pink-purple coloured strips. Interior white with some pink spots on and below the hinge area, and some pale pink-purple concentric strips in the latest formed part of the shell, the darker being on the posterior margin.
- (ii) The specimen in MNHN (Fig. 4), is 75 mm high, 66 mm long and 43 mm wide. General characters of the shell are comparable to the Geneva syntype. Gaping on both sides present, but not as wide (1.5 mm in the posterior edge). Number



Figures 1-3. *Acrosterigma angulatum* (Lamarck). Syntype MHNG. Locality unknown. Height 68 mm. Photo G. Dajoz, MHNG.
Figure 4. *Acrosterigma angulatum* (Lamarck). Syntype MNHN. Right valve. Locality unknown. Height 75 mm.
Figure 5. *Acrosterigma rugosum* (Lamarck). Right valve. Locality unknown. Exceptional specimen in size and shape to be compared with *A. angulatum* of figure 4. Height 75 mm.
Figure 6. *Acrosterigma rugosum* (Lamarck). Locality: Noumea, New Caledonia. Height 48 mm. A specimen with more standard characters.

of ribs: 33 in the right valve and 34 in the left one. As far as width is concerned the medio-posterior ribs and interstices are less differentiated. Exterior cream with roughly concentric pale orange-brown mottles principally on the medio-anterior part of the shell. Interior white with zones of very pale orange-brown under umbones and hinge.

Based on my examination I conclude these two syntypes to be conspecific (Seba shell was also probably conspecific), but my interpretation differs from that of previous authors: these syntypes are what is now generally known as *Acrosterigma alternatum* Sowerby, 1841 [lectotype designated by Wilson & Stevenson 1977: 84, pl. 5, fig. 13; BMNH 1971.24; type locality: Ticao, Philippines]. The correct identity of the Geneva syntype had already been recognized by Mermod, former curator in MHNG, as evidenced by a manuscript label in the collection.

It may be noted at this point that the type locality originally indicated by Lamarck ("the seas of America?") is erroneous whether the name *A. angulatum* is treated as a valid species (my opinion) or as a synonym of *A. rugosum* (Deshayes and later authors).

Comparison between *Acrosterigma angulatum* and *A. rugosum*

Admittedly, *A. angulatum* and *A. rugosum* bear some resemblance in the general aspect and particularly in colour, similar sizes (although *rugosum* is generally smaller), and number of ribs. Besides, *rugosum* can sometimes take an inequilateral shape with ribs very curved, similar to *angulatum* (see Fig. 5). Nevertheless essential differences exist between these two species, and a careful examination makes the confusion impossible. These differences are indicated in

Table 1

Table 1. Comparison between *Acrosterigma angulatum* and *Acrosterigma rugosum*

<i>A. angulatum</i>	<i>A. rugosum</i>
1. Shell with small anterior gap and wider posterior gap.	1. Shell not or exceptionally gaping.
2. Ribs (except in anterior and posterior 1/4) with highly asymmetric triangular section: posterior slope shorter and more abrupt than anterior one.	2. Except in posterior 1/4, ribs always rounded, only rarely and weakly asymmetrical
3. In central part of valve, anterior slope smooth, posterior slope with oblique sculpture.	3. Except in posterior 1/4, ribs with sculpture extending on both sides.
4. In medio-posterior part of shell crest of ribs often with tubercles.	4. In medio-post. part of shell crest of ribs without tubercles.
5. Intercostae with a riblet in central part of valve.	5. Intercostae flat, without riblets.
6. Intercostal sculpture only incremental lines.	6. Even oblique concentric striae in intercostae.
7. In post. part of shell intercostae loose central riblet and get a triangular section. In post. part of shell small, fragile, slightly curved scales on crest of ribs, almost in same axis than them.	7. In posterior part of shell intercostae remain flat. In post. part of shell solid arched scales, obliquely set on posterior part of ribs, forming with them a 45° angle.
8. In post. part of shell no secondary scales on edges of ribs.	8. In post. part of shell numerous flat secondary scales on edges of ribs, especially on anterior edge.
8. Pink, orange or purple colour morphs present, no dark speckles.	8. Pink or purple colour morphs unknown; often dark speckles.

Nomenclatural consequences of the new synonymy

The name *Cardium angulatum* Lamarck, 1819, has 22 years priority over the name *C. alternatum* Sowerby, 1841. Should it replace it?

Fischer-Piette (1977) listed 21 usages of the name *alternatum* between 1841 and 1975, all of them in papers on taxonomy and lists of species, without any extensive literature on ecology, biology or anatomy; the species is not cultured, and not known as a host or intermediate host of parasites.

By contrast the name *angulatum* has rarely been used in the last decades. Reinstating it as a valid name in place of *alternatum* will cause only a name change, and is not likely to create confusion. Furthermore the name *angulatum* is perfectly stabilised by two syntypes.

I believe that stability of nomenclature is best served by adhering strictly to the law of priority, and consequently I will not apply to the International Commission on Zoological Nomenclature to have Lamarck's name rejected. I instead propose to use the name *Acrosterigma angulatum* (Lamarck) as typified by the type material referred to in the present paper.

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